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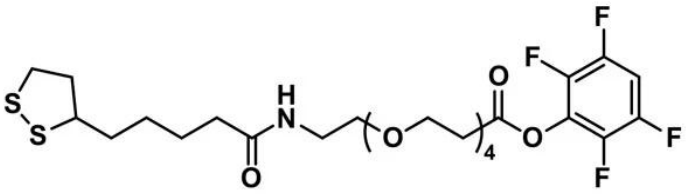
LIPOAMIDO-DPEG®₄-TFP ESTER

SKU: QBD-10641



DESCRIPTION

Lipoamido-dPEG®4-TFP ester, product number QBD-10641, is a single molecular weight, discrete PEG (dPEG®) modifier of gold and silver surfaces, for example, on nanoparticles. The lipoic acid moiety on one end of the 24-atoms-long dPEG® spacer forms dative bonds with metals like gold and silver. The TFP ester reacts with free amines to form free amines, optimally in the pH range 7.5 – 8.0. The distance from the disulfide bond in the lipoic acid ring to the carbonyl carbon adjacent to the 2,3,5,6-tetrafluorophenol (TFP) ester, the distance is 24 atoms (28.0 Å). Applications for this product include creating self-assembled monolayers (SAMs) on metal surfaces and crosslinking and immobilizing peptides and proteins to the surfaces of metal nanoparticles.

Lipoic acid, also known as alpha-lipoic acid, α-lipoic acid, and thioctic acid, consists of a five-membered ring containing a disulfide attached to a pentanoic acid group. As a naturally occurring antioxidant, lipoic acid functions as a cofactor in several enzyme systems. It is a bidentate thiol ligand that forms two stable dative bonds per lipoic acid group with gold, silver, and other metals. These dative bonds form with oxidized lipoic acid or reduced dihydrolipoic acid (DHLA). Because it forms two dative bonds on metal surfaces, lipoic acid is more stable than PEGylation reagents containing a single thiol. This increased stability prevents lipoic-acid-functionalized dPEG® products from being oxidized off the metal surface. The lipoic acid group forms dative bonds with metals with or without reduction to DHLA. If reduction to DHLA is preferred, Tris(2-carboxyethyl)phosphine (TCEP) will rapidly reduce lipoic acid to DHLA.

TFP esters react more readily with amines and possess better hydrolytic stability than N-hydroxysuccinimide (NHS). The superiority of PEG-TFP esters over NHS esters is documented in

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the scientific literature.

When using this product, it is typical to conjugate the carboxyl end of the dPEG® to an amine to form an amide bond before forming a dative bond between a metal surface and the lipoic acid moiety of Lipoamido-dPEG®4-TFP ester. The TFP ester reacts optimally at pH 7.5 – 8.0, but it will also react with amines at pH values above and below this range.
Lipoamido-dPEG®4-TFP ester has limited solubility in water or aqueous buffer. We recommend using dry (over 3 Å molecular sieves) water-miscible solvents such as N, N-dimethylacetamide (DMAC) or acetonitrile to form a stock solution that can be added to aqueous buffer to carry out the reaction.

SPECIFICATIONS

CAS Number	N/A
Molecular Weight	601.67; single compound
Chemical Formula	$C_{25}H_{35}F_4NO_7S_2$
Purity	> 98%
Unit Size	100mg, 1000mg
Solubility	Methylene Chloride, DMSO, DMAC, DMF or Acetonitrile.
Spacers	dPEG® Spacer is 24 atoms and 28.0 Å
Storage Instructions	-20°C; Always let come to room temperature before opening; be careful to limit exposure to moisture and restore under an inert atmosphere; stock solutions can be prepared with dry solvent and kept for several days (freeze when not in use). dPEG® pegylation compounds are generally hygroscopic and should be treated as such. This will be less noticeable with liquids, but the solids will become tacky and difficult to manipulate, if care is not taken to minimize air exposure.
Shipping Instructions	Ambient

DOCUMENTS

- Safety Data Sheet
- Datasheet

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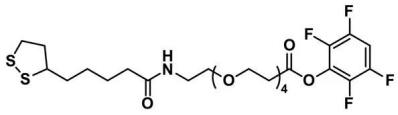
GALLERY IMAGES



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